under two had decreased, but deaths between five and ten had increased. The transfer to measles was therefore due to the fact that smallpox usually came first and carried off the weakly infants. When we consider the overwhelming power of infectious diseases at a time when half the children died before reaching the age of ten it is clear that the removal of the first hurdle was sufficient to cause a greater number to fall at the second.

Watt's theory met with some opposition particularly from Jenner who objected to what he called its evil tendency, and it seemed to be proved false by a further outbreak of smallpox. Later experience, however, proved its truth, for when smallpox continued to decline, scarlet fever came into prominence, diphtheria appeared in 1858 and cerebrospinal fever in 1865.

These considerations led Farr to write in 1874: "The zymotic diseases replace each other; and when one is rooted out, it is apt to be replaced by others which ravage the human race indifferently whenever the conditions of human life are wanting. They have this property in common with weeds and other forms of life: as one species recedes another advances.... For the mere exclusion of one out of many diseases appears to be taken advantage of by those other diseases, just as the extirpation of one weed makes way for other kinds of weeds in a foul garden."

Farr carried the argument further. Following Blane, who, in 1815, had attributed the increase in consumption in young adults to the saving of sickly children, he said that "the effect of the subtraction of the early fatal zymotic diseases and of phthisis, fatal in middle life, is to leave greater numbers alive at the advanced ages—greater numbers to die of the diseases attendant on advancing age". And he made this calculation, pregnant with meaning for the future: "If those who had cholera in Paris had been seized by consumption they would have endured 73,000 years of sickness instead of 158,118 days [i.e. 433 years]; the living in the epidemics of the Middle Ages could not have watched the sick if their diseases had been protracted."

The substitution of chronic for infectious diseases was indeed well under way when Farr wrote, for in Chadwick's tables for the year 1838 deaths from infectious diseases were far surpassed by deaths from diseases due to other causes.

REFERENCES

BELL, W. G. (1951) The Great Plague in London. London.
BLANE, G. (1822) Select Dissertations. London; Vol. **5.**
CARR-SAUNDERS, A. (1922) The Population Problem. Oxford.
CREIGHTON, C. (1891) A History of Epidemics in Britain. Cambridge; Vol. **1.**
DALRYMPLE-CHAMPNEYS, W. (1955) *Proc. R. Soc. Med.*, **48,** 13.
FARR, W. (1885) Memorial Volume. Ed. by N. A. Humphreys. London.
GRAUNT, J. (1662) Natural and Political Observations in the Bills of Mortality. Oxford.
HARE, R. (1954) Pomp and Pestilence. London.
HAWKINS, F. B. (1829) Elements of Medical Statistics. London.
HAYGARTH, W. (1793) Sketch of a Plan to Exterminate the Casual Small-pox, etc. London.
HEBERDEN, W., Jr. (1801) Observations on the Increase and Decrease of Diseases. London.
HECKER, J. F. C. (1859) The Epidemics of the Middle Ages. 3rd ed. Trans. by B. G. Babington. London.
MALTHUS, T. R. (1789) Essay on the Principle of Population. London.
MARSHALL (1819) Report on the Validity of the Doctrine of Contagion in the Plague. London.
TREVELYAN, G. M. (1942) English Social History. London.
ZINSSER, H. (1935) Rats, Lice and History. London.

[*June* 1, 1955]

The Medical Student Through the Ages

By Sir WELDON DALRYMPLE-CHAMPNEYS, Bt., D.M., F.R.C.P.

INTRODUCTION

"THE dissecting-room is his favourite resort for refreshment, and he broils sprats and red herrings on the fire-shovel with consummate skill, amusing himself during the process of his culinary arrangements by sawing the corners off the stone mantelpiece, throwing cinders at the new man, or seeing how long it takes to bore a hole through one of the stools with a red-hot poker." The passage I have just quoted is from a little book entitled "The London Medical Student," by Albert Smith, published in 1861 and sold for one shilling, a book which my father commended to my notice many years since and which suggested to me an investigation of that strange genus, the medical student.

A complete consideration of the medical student through the ages would, of course,

require a lengthy treatise, and not an hour's dissertation and I have, therefore, aimed at giving you a picture, necessarily very incomplete, of the medical student as an individual, his origins, conditions of life, habits, reputation, &c., leaving aside his education, except in so far as it affected these other aspects.

I have searched, so far as I was able, the early records, because, as I sought to show in my Presidential Address to the Section of Epidemiology of this Society in 1944 (Dalrymple-Champneys, 1944) in respect of the fully fledged doctor, it is profitable to mark the changes which have occurred through the ages and their relationship to the state of society at the time and in the country under consideration. These early records are, of course, scanty and deductions from them often speculative, whereas those of the Middle Ages and even more of the last two centuries are far more plentiful, but I shall try to preserve some balance here. In order to shorten this account I have not considered the ancient civilizations beyond the point where rational medicine, whether Greek or its child, Western medicine made its impact.

"Medical Students" among Primitive Races

When considering the equivalent of the medical student in primitive times, or to-day among primitive races, it is necessary to examine briefly the profession for which he was (or is) training. The function of the primitive medical practitioner or witch doctor is through secret traditional lore and by means of his mystical art to counteract enchantments, fend off demons, say how an enraged deity may be pacified, influence the weather, ensure success in the chase or a favourable result in battle, and foretell the future—a comprehensive assignment which not even our National Health Service completely covers. To fulfil this task he employs both physical means, some of which are of genuine efficacy, and psychological methods—chiefly suggestion (Neuburger, 1910). In order to preserve the requisite degree of mystery in their doings such people live apart from the rest of the community and cultivate habits in regard to eating, sleeping and occupation different from the ordinary members of their tribe.

The student witch doctors of some tribes are drawn from the families of the qualified practitioners, in others they are selected for the aptitude shown by them during the training accompanying the initiation at or around puberty (Bolinder, 1954), whilst among yet other peoples their selection depends on the circumstances of their birth (e.g. being one of twins) their liability to dreaming, or to epileptiform attacks (e.g. the Shamans of the native Siberian races). The candidates thus chosen undergo a period of hard and solitary training, either at the hands of old practitioners chosen for the purpose by the association of witch doctors, where such exists, or by an individual medicine man to whom the student has attached himself. In many tribes the candidate is only accepted as a regular practitioner if he can pass a practical examination. And here I would pause for a moment to remark that though the rewards of the practitioner are often considerable enough to furnish a powerful inducement to youths to enter this profession, yet the profession carries with it special risks and the death of a patient cannot always be successfully shifted on to the shoulders of the "malevolent medicine man of an unfriendly tribe".

Mesopotamia

Mesopotamia, which has been called the cradle of civilization, already exhibits as early as about 4,000 B.C. an important change in the character of its doctors, namely their identification with the priesthood, a character which persists through all subsequent civilizations (with the possible exception of the Egyptian in its early phases) until the late Middle Ages. Though we are dealing here, even in Sumerian times, with a much more advanced and elaborate civilization than that of the primitive peoples to which I have just referred, yet medicine is still largely magic and the principal science conditioning it is that of mathematics. As Neuburger says, "theory was deduced from experience, and facts acquired empirically were systematized from the point of view of a demonistic religion coloured by astrology". The influence of numbers was held to be of great importance, especially the number 7 which was considered very malignant, so the Mesopotamian priests can perhaps be regarded as the true ancestors of our modern statisticians! The great complication of their medico-astrological system as well as the severe penalties for unsuccessful treatment laid down in the famous code of Hammurabi (*c.* 2,200 B.C.) suggest that the medical student of the time must have undergone a long and intricate training before he could stand much chance of survival in the world of medical practice. Thus the code lays down that "If the physician make a severe wound with the bronze operating knife and the patient die, or if he open the growth with a bronze operating knife and the patient lose his eye, he shall have his hands cut off". If the patient were a slave the physician merely had to replace him by another slave. It is worth noting that the doctor was only controlled by regulations such as this when acting as a *surgeon*, but as regards *medical* treatment he appears to have enjoyed immunity from the law as a member of the priestly caste (Contenau, 1938).

Egypt

In speaking of the ancient Mesopotamian civilizations and the priestly character of their physicians I have mentioned that there was a possible exception to the universality of this custom in one civilization, namely in the earlier dynasties of Egypt. According to Withington (1894), during the fifth dynasty (*c.* 3,500 B.C.) and perhaps earlier, when life in Egypt had a more patriarchal character, physicians and other professional men had not yet been absorbed into the priesthood and their tutelar deity was still Sekhet, the lion-headed Goddess of War, and not Thoth, the God of Wisdom, as in later times. Moreover, the hieroglyph representing the physician was a lancet and cupping horn, but later this disappeared. However, little is known about the doctor or medical student of this early period and by the time the evidence becomes more plentiful we find the medical student studying alongside the budding judges, astronomers, mathematicians and others in the schools associated with the temples, and living in the houses attached to the schools under the inspection and discipline of their teachers, one of whom in a passage translated by Chabas thus admonishes his pupil: "Let not idleness overtake thee else shalt thou be severely chastised. Hang not thine affections upon pleasures and take care that the books fall not from thine hand. Exercise thyself in conversation and speak with thy superiors in learning. When thou shalt grow older thou wilt recognize how important this is: whoso is dextrous in his craft achieves power and fame." Another frivolous student is thus reproved: "It has been reported to me that thou neglectest thy studies and seekest only thy pleasure, wandering from tavern to tavern. But what profiteth the odour of beer? Avoid it, for it drives people away from thee, impoverishes thy wits, and likens thee to a broken oar upon the deck of a ship." These medical students were drawn from all classes, industry and talent being the only passports to the schools. It seems almost certain that, apart from textbooks (the 42 sacred books and probably commentaries on them), the student received practical instruction in the examination and treatment of the patients who came to the temples for healing. I must not close this brief reference to the subjects which the medical student of ancient Egypt had to study without referring to hygiene, which was so highly developed there and had such a profound influence on the whole life of the people and on that of succeeding civilizations such as the Jewish and the Greek. Herodotus says that "the Egyptians are, with the Libyans, the healthiest nation" and Diodorus remarks that "the whole manner of life was so evenly ordered that it would appear as though it had been arranged according to the rules of health by a learned physician, rather than by a lawgiver". In this subject the medical student seems, therefore, to have been instructed from a body of learning based on experience and not on magical theories, and consequently far more advanced than the knowledge of curative medicine, so far as we can tell from records at present available.

Persia

Though little is known of medical education or practice in ancient Persia a passing reference must be made to the practical test to which a budding surgeon was subjected (the surgeon being the lowest of the three grades of medical practitioner). This test consisted of two parts, the first carried out on three "heretics", and if all three died following their operations then the surgeon was debarred from practice for the rest of his life. If he passed this first part of the test he proceeded to the second part consisting of operations on three "believers", and if all three survived then he was qualified for life, however many patients he might kill subsequently.

India

Medicine in India in the first or Vedic period (up to about 800 B.C.) consisted in an attempt to fit empirical knowledge into a framework of polytheism and a demonistic conception of nature, but I have not been able to obtain any information regarding the recruitment and training of medical practitioners. When we come to the Brahmanic period, the golden age of Indian medicine, there are several interesting features related to my subject. The true medical practitioners belonged to the high mixed class of Ambastha, descended on the father's side from Brahmans, but they were assisted by a subordinate type of practitioner, empiricists, belonging to the lower caste of the Vaisya. The Ambastha physicians were undoubtedly priestly, they were chosen from good families, preferably medical ones, and manual dexterity and certain physical and moral endowments were required of the candidates for instruction. Their training closely resembled that of Brahman scholars and emphasized reverence for Brahmans, their teachers and their ancestors. The youths were admitted in winter with a waxing moon, upon an auspicious day, and in the presence of the Brahmans. At a ceremony of dedication they took a vow to observe their religious duties and the rules of their profession. Their instruction, which lasted six years, was partly theoretical, consisting mostly of learning by heart precepts explained by the teacher and derived from an approved textbook, and partly practical instruction given at the bedside, and in the practice

of surgical procedures. One admirable feature was the rule that no teacher might instruct more than from four to six pupils at the same time. At the end of the course they had to obtain leave to practise from the king. As regards medical ethics, in contrast to the oft-quoted saying "In illness the physician is a father, in convalescence a friend; when health is restored a guardian", the practitioner was forbidden to treat incurables, hunters, fowlers, caste-breakers and criminals, a prohibition which we find with local variations in the medical codes of all civilizations (including the Hippocratic code) before the Christian era.

China

In ancient China, as in all early civilizations, medicine was practised by the sorcerer or priest, often referred to as the "priest-doctor" (Wu I). The powers of these men were unlimited and their influence extended to every walk of life then extant (Wong and Wu, 1936). The functions of priest and doctor were not separated till the Chou dynasty in 1140 B.C. and the Chou Li, a classic of this period, directs the sorcerer to make offerings in time of drought and the doctor to superintend all matters relating to medicine and to collect medicinal herbs. The superstition of the masses, however, made such a separation largely ineffective in practice, which provoked the celebrated Pien Ch'iao to remark that "A case is incurable if one believes in sorcerers instead of in doctors"—an aphorism which has its applications even to-day! All the same whether practised by sorcerers or doctors medicine in those early times was, with all its limitations, based upon observation and knowledge, whereas when we come to the middle of the Chou dynasty, about 722 B.C., the age of Confucius, Lao Tzu and Mencius and one of the most glorious periods in Chinese history, this empirical art had become replaced by an elaborate theoretical system of ever-growing complexity and diminishing meaning and effectiveness. In contrast to the content of medicine, medical organization was highly developed during this period and the Chou Rituals distinguish four kinds of doctors, namely, physicians, surgeons, dietitians and veterinarians. The work of all these doctors was to be examined at the end of the year by the chief doctor and their salaries fixed according to the success of their treatments—shall we come to that one day? Medical students, like other students, were members of the scholar-gentry, the mandarinate into which, Dr. J. Needham tells me, families rose and out of which they sank within a few generations. These students generally had some Taoist affiliations, but the profession was not greatly looked down on by Confucian scholars, some of whom certainly practised medicine. In later centuries Buddhist compassion must, he thinks, certainly have provided a considerable urge to join the profession and no abbey, whether Taoist or Buddhist, was probably ever without its medical specialists. Medical education was first started in the T'ang dynasty (A.D. 618–906) and in the Northern Sung dynasty (A.D. 960–1126) regular medical schools were organized, first in the capital and later in other parts of the country, starting with the foundation of an Imperial Medical College in A.D. 1076. These colleges had their ups and downs and many were closed down at certain periods, often to be reopened later. An elaborate system of examinations, both oral and clinical, was a feature of this educational system and lists of textbooks recommended to the students are still extant. The teachers were liable to punishment or dismissal not only for neglecting their teaching but also for failure to make their students work. State examinations fell into disuse at one period, but were revived under the Yuan dynasty in A.D. 1317 and successful candidates were guaranteed posts, the importance of which depended on the quality of their performance at the examinations. It is worth noting that during the same dynasty women doctors were first given recognition and special arrangements made for their examination.

Chinese medicine began to decline under the Ming dynasty (1368–1644), reaching its lowest ebb in the Ch'ing period (1644–1911). All medical colleges disappeared with the exception of the Imperial College of Physicians in Peking, whose sole function was to train physicians for the imperial family, so that the ordinary physicians had no opportunity of preparing for their life's work, nor was there any kind of government supervision or code of ethics. The higher grades of doctor served an apprenticeship under an old doctor or in a druggist's shop and the public placed most confidence in members of medical families, the longer the tradition the higher the prestige (Morgan, 1922-23).

Jewry

The sources of information with regard to Jewish doctors and medical students especially in pre-Talmudic times (before the third century A.D.) are very scanty, as no medical works have come down to us from the ancient Hebrews. One must also remember, as Dr. Charles Singer has pointed out to me, that the Jews being an agricultural race with scattered population and poor communications, the conditions for the development of a real medical profession were mostly absent. However, true doctors eventually appeared, and during the Talmudic period medicine was an officially recognized profession. These doctors were definitely general practitioners and not priests (Friedenwald, 1944), the latter's medical

functions being confined to the practice of preventive medicine by the enforcement of public health ordinances, though there were rabbis such as Samuel (A.D. 200) who possessed medical knowledge and applied it (Snowman, 1935). Moreover, all judges were supposed to have medical knowledge and even knowledge of pathology to enable them to decide whether meat was fit for human consumption. Medical ethics in Jewry were certainly greatly in advance of those elsewhere, even in classical Greece, for, as Preuss points out (Preuss, 1923), the Jewish physician was not an authorized killer, nor did Jewish law punish him by death or mutilation if his patient died, nor was he forbidden, as in the Hippocratic code, to treat apparently hopeless cases. These conditions and the fact that the patient was enjoined by his religion to pay the doctor his due fees, sometimes demanded in advance, must have made the profession seem not unattractive to the prospective medical student. According to Snowman nothing is known about the methods of medical education, beyond the indication that physicians took private pupils, but W. Pagel (private communication, 1955) considers that the frequent references to visits by "physicians" (in the plural) means that the real physician was accompanied by his pupils, for instance the physician Thodos "and all physicians with him" repair to the academy at Lydda in order to decide whether certain bones belonged to the same skeleton.

Greece

In contrast to the magical and rigidly traditional world of Assyrian medicine, and the more rational but hardly less rigid Egyptian cult, the medicine of ancient Greece, whose flower is preserved for us in the Hippocratic writings, seems like a breath of fresh air or a flooding of sunshine into a dank and sinister cave, for though the priests of the temples of Asklepios jealously guarded the belief in divine revelation as a guide to medical treatment, yet they were content to maintain the closest and most friendly relations with the true doctors, the Asklepiadae whose medical schools were established in close proximity to the temples which they regularly frequented and where they studied the illnesses and cures of patients treated there for all kinds of diseases.

Medical teaching in these schools of the Asklepiadae—which resembled modern academies rather than universities—began at an early age and in the common case of a doctor's son was naturally initiated by the father. It was continued by practical training from other doctors to whom an honorarium was payable and the pupil when qualified was bound to teach the healing art to the sons of his teacher without remuneration (Puschmann, 1891). The oath which the student eventually took on admission to the Society of the Asklepiadae is preserved in the later Hippocratic collection and represents a far higher ethical code for the regulation of the doctor's life and practice than the world had known previously. The picture it paints of the relations between teacher and student is one that any teacher to-day might envy, as the budding doctor swore "To regard my teacher in this art as equal to my parents". It is obvious from this oath and from what we know of the way of life in Hippocratic and post-Hippocratic times that the medical student must have lived a far healthier life than in most other ages and countries, and a much more interesting one as Greek medicine, like all Greek learning, derived its glory from the impulse of intense curiosity which alone can further the advancement of scientific research. As time went on this healthy empiricism was gradually stifled and distorted by the influence of religious cults from the East, but enough survived to blossom many centuries later in the Renaissance.

Rome

In the earlier days of Rome of which we have records medical knowledge was transmitted from father to son, or to a relative or friend. Teaching was under the personal supervision of the doctor. Later when Greek medicine came to Rome the Greek doctors taught their art there, and in Rome, as in Greece, medicine was a profession open to anyone who thought he had the necessary ability for it. There were no legal regulations and the medical student obtained his knowledge where and how he liked, so that there was great variation in the quality of the practitioners. Pliny condemned this state of affairs in no uncertain terms, and Galen wrote a treatise on the need for a doctor to be trained in both mind and morals. In Cato's time general education included, with law, military science and agriculture, some knowledge of medicine. The period of medical study varied widely. Galen devoted eleven years to his medical studies, whilst the notorious charlatan Thessalus obtained large numbers of pupils by promising to turn them into doctors in six months. According to Galen many of these pupils could not read or speak correctly. There was, of course, no real anatomical teaching at this time, and even Galen derived most of his anatomical knowledge, as he admits himself, from dissection of the lower animals.

Serious students of medicine learnt chiefly by accompanying their teachers to the homes of the patients and it is not surprising that the visit of a doctor accompanied by a large body of pupils (sometimes 30 or more) was not always appreciated by the patient, as is

shown by Martial's epigram on his doctor Symmachus: "I was ill. Thou camest forthwith to me—accompanied by 100 pupils: 100 ice-cold hands were laid on my body. Till then I had no fever: now I have." Galen tells his pupils to be quiet when entering the sick room, to be clean and attend to their hair; they must not eat onions or garlic before visiting a patient, or drink too much wine, lest they annoy the sufferer by the offensive odour from their mouths and "stink like goats" (Puschmann, 1891).

The Arabs

Few phenomena in history are more curious than the destruction of highly advanced Western civilization by the Arabs, their wise and providential preservation of so much priceless literature taken from their fallen foes, their perpetuation and development up to a certain point of many of the most enlightened ideas of the Greek and Roman writers, and their ultimate failure to progress further on account of their exaggerated respect for tradition. This respect for tradition was not, however, accompanied by a rigid discipline in the class-room; and in the earlier period of Islam, at any rate, the pupils attending the teachers in the mosques (the lectures, by the way, being gratuitous and open to all without distinction of nationality) were encouraged to discuss their teachers' propositions with great freedom. Such lectures were attended by persons of all ages and often from places far away. Such free interchange of knowledge was, of course, encouraged by the fact that Arabic was the common language of all Islamic countries. The students were often given certificates of attendance at their teacher's lectures and a permit to disseminate the knowledge they had acquired from him.

In the later phases of Arabian learning institutions were founded closely resembling universities, such as the "House of Wisdom" founded by the Caliph Hakim Biimrillah at Cairo in 1105, where medicine was taught in conjunction with other sciences and even Jews and Christians were allowed to attend the lectures. At this period the three courses of training open to a medical student were instruction under the personal supervision of a senior physician, attendance at a medical teaching establishment, or finally teaching in one of the many medical schools attached to hospitals.

The doctors of Islam enjoyed high social standing and were often loaded with honours and distinctions, not a few attaining the rank of Vizier, corresponding roughly to a Privy Councillor.

Middle Ages

When we come to the Middle Ages the material available is almost embarassingly plentiful, though there are many questions to which I have not yet found an answer.

First of all it is necessary to emphasize the common background of all mediæval students, to whatever faculty they belonged, and secondly what a very special section of society they represented. The most important prerequisite for any student was, of course, a knowledge of Latin, without which he could derive no benefit from instruction at any university. Latin, as Rashdall (1895) remarks, "was not merely the language of the lecture-room, but theoretically at least of ordinary student life". It was necessary for ordinary intercourse because, at any rate in the earlier period, students from different provinces of the same country could hardly understand each other in their mother tongue and the student bodies of all universities were still very cosmopolitan. It is worth noting that the use of Latin as a lingua franca was made easier by the fact that Englishmen then pronounced Latin in the continental way, the barbarous "English" pronunciation being introduced only in the life-time of Dr. Caius. At Paris in order to be admitted to studentship a petitioner had to state his case before the Rector in Latin without any interposition of French words. In the later period Latin speaking in College and Hall was strictly enforced by statute—in my time at Oriel we were sconced for quoting Latin or Greek in Hall! The task of teaching Latin to the prospective student was carried out by the Grammar Schools which were widely diffused all over England at this period, whilst in the university towns there were grammar schools, of an inferior kind, usually under the control of the university. The university student, including the medical student, was an ecclesiastic, but knowledge of Latin was not confined to the clergy, as even the bailiff of a manor always kept his accounts in Latin.

But let us look back to see where these students came from. The vast majority were of an intermediate social position, sons of knights, yeomen, merchants, tradesmen or thrifty artisans, nephews of successful clerics or promising lads who had attracted the notice of a neighbouring Abbot or Archdeacon. Though the majority were not in really straitened circumstances there are many accounts preserved which illustrate the poverty of some of the students and the begging by which alone they could sustain themselves. Thus a poor student at Bologna in the fifteenth century complained: "The time I should spend at lectures and in study I am driven to waste in begging from door to door, crying scores and scores of times—'Charity, charity, dear masters', and getting the answer 'Begone, and God be with

you'. I appeal both to ecclesiastics and laymen, and am mostly driven from the door, or perchance one may say 'Wait a bit', when I get a dirty scrap of bread which a dog would reject, or I may get fusty beans, bits of skin or gristle, or sour wine" (Allbutt, 1921). As regards age the freshman ranged between 13 and 16 and though it seems certain that boys matured earlier in the circumstances of mediæval life, yet the youth of the students was presumably partly accountable for the wild pranks so common in the universities of the time and the kind of punishment considered appropriate in such cases. In the first part of the period corporal punishment was prescribed for many offences committed by the younger students and at the Sorbonne each Master was responsible for flogging his own clerk when necessary, but at the English Universities the age of whipping was prolonged to the verge of manhood, though in the second half of the fourteenth century the statutes of Queen's College, Oxford, limit it to the "poor boys", who could not pay a fine and whose careers would have been permanently ruined by being sent down. By the beginning of the sixteenth century, however, we find the Brasenose undergraduate reduced to the schoolboy level and whipped by his college lecturer for unprepared lessons, playing, laughing or talking in lecture, making odious comparisons, speaking English, disobeying the Lecturer, not attending at Chapel, &c. Here are a few examples of the wild pranks of the mediæval undergraduate. Gangs of students often strolled the streets at night in any of the university towns, singing, shouting, dancing, beating up the watch, and not infrequently killing citizens who incurred their displeasure, whilst occasionally on the Continent pitched battles ensued between armed students and the retainers of some great lord, lay or ecclesiastic, such as the famous affair between the Paris scholars and the monks of the Abbey of St. Germain in 1278, and the Affaire Savoisy in 1404, in which the retainers of the King of France's Chamberlain, Charles of Savoisy, pursued Paris students of a later generation even into a church where Mass was being celebrated. When it is realized that the student was protected from punishment for even the most outrageous offences including murder by his clerical status, it is no wonder that feeling between town and gown was strong and that the lay population opposed these privileges with bitterness and fury. Only occasionally was the offending student obliged to seek sanctuary as a first step to leaving the country. No doubt this state of things was partly accounted for by the intolerable tedium of student life, from which all amusements in our sense of the word were completely absent, and to the drinking habits of an age which knew neither tea, coffee nor tobacco and in which all important events were celebrated by bibulous feasts. In the Halls or Colleges often the only fire, in winters far more severe than those to which we are accustomed, was in the kitchen and often there was a special statute forbidding students to repair to this sole source of warmth after dinner. The windows of their rooms were closed by wooden shutters, there being no glass windows until about the mid-fifteenth century, the floors were of clay or tiled, bare or strewn with rushes, and the ceiling unplastered. The furniture, except in the case of the few rich students or some of the seniors, consisted of a truckle bed, a table and a few chairs or "playne joyned stooles". Simple bedclothes, which in the case of the humbler scholars did not include sheets, a coffer for his clothes, and a press if he was studious, completed the furnishing of his room.

And what about food? The principal items in the student's diet seem to have been meat, bread, butter and cheese, probably in sufficient quantities, washed down with plenty of small beer. The two main meals were dinner at 10 a.m. (later at 11 a.m.) and supper at 5. The "jentaculum" or early breakfast did not become a regular institution until the fifteenth or sixteenth century and was even then regarded as an extra which the hardier or more economical student would dispense with. This is the more remarkable when one remembers that lectures usually started at 5 a.m. or 6 a.m. in the summer and 7 a.m. in the winter and were held, or course, in unheated rooms. In the earlier period there seems to have been a maximum of three compulsory lectures a day, the first morning lecture sometimes lasting for a prescribed period of three hours, but these were supplemented more and more as time went on by smaller and more informal exercises in Hall or College. The teaching of anatomy when not purely didactic generally consisted in occasional public dissections conducted in a manner which throws an interesting light on the tastes and manners of the Middle Ages. Felix Platter, a medical student of Montpellier in the sixteenth century, describing such a public dissection at which Dr. Guichard, a member of the faculty, presided, but which was actually performed by a barber, as was usual, says that "besides the students, there were in the audience many members of the nobility and bourgeoisie, and even young ladies, in spite of the fact that the subject was a man. There were even some monks" (Vaultier, 1954). But the students at Montpellier obviously found such instruction insufficient because Platter and his friends thought it worth while to hire a house in a secluded neighbourhood to which they brought newly buried bodies which they had snatched from the town's cemeteries at night, an activity which sometimes involved them in armed battles with the monks.

I must not leave this account of the mediæval student without brief reference to a very important condition affecting his life, namely the extraordinary degree of autonomy which

he enjoyed, all the more extraordinary in view of his tender age. This autonomy was greatest in the Italian universities such as those of Padua and Bologna which were governed almost entirely by the student body, the teacher at Bologna, for instance, being obliged to take the oath of obedience to his pupils, without which he was unable to collect his lecture fees and was liable to further punishment at the will of the Rector, an official elected by the student body (Riesman, 1936). In the early period the population of the universities was a very floating one, for not only did students wander from one university to another, but on occasions a large section migrated to another university, or even set up a new university in another town. Thus there was a large migration from Padua to Vercelli in 1228, and from Vicenza to Bologna a little later, and in 1229 when there was a revolt by the University of Paris against the town the King of England invited the University to migrate to his country, a threat which, as usual, brought the town to their knees. At the University of Paris, and at Oxford and Cambridge which were modelled on it, control was in the hands of the Masters and of the Church, the balance of power swaying backwards and forwards, but even here the student had full liberty (unless his parents were rich and made special provision for him) to choose the Master whose lectures he would attend and the Hall where he would live, unless he found his own lodgings in the town. The mediæval Hall was hired by a party of students banding together and the Principal was merely the student who made himself responsible for the rent. Later at Oxford and Cambridge the Chancellor gradually acquired more control over the Halls and the system was gradually superseded on the advent of the Colleges.

Seventeenth Century

An interesting light on the student's life in the seventeenth century is thrown by Pousson (1931) in his account of medical instruction in the University of Bordeaux before the Revolution. From the foundation of this university up to the middle of the sixteenth century the medical students were clerics living in monastic houses under the strictest discipline, their only recreation being to take part in religious processions and pageants. But from that time onwards the students mixed with the population of the town and by their superior education exerted a civilizing influence on the shopkeepers, artisans and small merchants with whom they lodged, as well as by the masques, morality plays, allegories and farces in the French or Gascon languages which they composed themselves and which were within the understanding of the townspeople in general. There were, nevertheless, many less admirable students who, as elsewhere, frequented taverns, started brawls and sometimes killed other students belonging to groups from different regions, or even peaceful townsmen.

As regards the budding barber surgeon at this period his apprenticeship was no life of luxury, as we learn from the autobiography of Johann Dietz whose apprenticeship started at the age of 14 and whose morning meal consisted of a slice of dry bread washed down with water or small beer. At first his duties included carrying logs and water for the maid in the kitchen and carting dung in the garden and punishment was never far off, so that he used to twist the whip up in a towel so that he could escape before it could be untwisted (Dietz, 1915).

It has been commonly supposed that doctors in France before the Revolution were recruited mainly from the upper classes, but Fauvelle (1899) has pointed out that on the contrary they came chiefly from the prosperous bourgeoisie, prosperous because the length of the medical curriculum and the long unremunerative stage succeeding qualification necessitated the possession of some fortune by the student's parents, unless he was lucky enough to have secured the patronage of some rich person. Most medical students of the period had, in fact, great difficulty in making both ends meet. They lived in very simple and often sordid lodgings, but the luckier ones managed to secure a room in a respectable house furnished usually with a bed, a plain wooden table, a chair or stool and an untidy mass of papers, exercise books, theses, &c., besides a few essential textbooks such as Latin translations of Galen and Hippocrates. Their dress in the earlier part of the seventeenth century consisted of black woollen stockings held up by knotted garters, baggy long black boots, the tops of which were fastened by laces to the "pourpoint" or tunic. Over all this the student wore a padded "rabat" or short coat. He wore his own hair, for it was not until the end of the century that wigs came into fashion, together with lace, ribbons, &c. (Cabanès, 1913). The medical course at the University of Paris at this time lasted four years, though doctors' sons and some other privileged persons had this period reduced to twenty-eight months. It is worth noting that anatomical dissection, which was compulsory, was carried out during the first year of study.

Eighteenth Century

The difficulties of obtaining subjects for dissection persisted through the eighteenth century and led at times to scandalous scenes, the toleration of which is a good index of the coarseness of the times. When Dr. Frank Nicholls, later the leading anatomical teacher in England

and one who influenced Hunter, was lecturing at Oxford in 1730, a near riot occurred over a body wanted for dissection. "Hanged at Oxford, one Richard Fuller of Caversham in Oxfordshire, a young man of 26 years of age for murdering his wife. There was sad work on that occasion, the scholars endeavouring to get the dead body, assisted by some Townsmen, and others on the contrary hindering. The relations had provided a coffin to have it decently buried at Caversham but the scholars broke it all to pieces, the body being in it; after which those opposite to the scholars had it again and so for several times, sometimes one side had it and sometimes the other, but the Proctors favouring the relatives, the body was at last delivered to them and brought to the Castle; about eleven at night when all was thought still, it was taken to the water side to send it away in a boat, but to their surprise the scholars were lying in ambush and coffin and all was thrown into the water, but the scholars soon went in in great numbers and drew it out and carried it to Christ Church to dissect it. The tumult was so extraordinary that the town clerk was forced to read the Proclamation but to no purpose, the rioters crying out they did not hear it" (Sinclair and Robb-Smith, 1950).

Nineteenth Century

The system of medical apprenticeship persisted well into the nineteenth century and its conditions at the beginning of this century are described by Jesse S. Myer (1939) in the following passage. "Living under the same roof, as was customary in the days of medical apprenticeship, the preceptor could look after both mind and morals of his pupil. The fledgling, in return for the instruction received at the hands of his master, not only compensated him for his trouble, but performed many of the menial offices of a servant about the house and the office. It was he who prepared the powders, mixed concoctions, made the pills, swept the office, kept the bottles clean, assisted in operations, and often through main force supplied the place of the anæsthetic of to-day in the amputation of limbs and other surgical procedures. He rode about with the doctor from house to house, profiting by his personal experience and jotting down in the pages of his notebook and on the tablets of his memory the words of wisdom that fell from his master's lips." Opportunities for dissection were mostly limited to occasional amputated limbs, but some apprentices were lucky enough to have enlightened masters who took an interest in their pupils' education or had the opportunity of attending classes on anatomy given by local surgeons, as Sir James Paget describes in his autobiography, and, of course, many, like him, went on to a hospital to continue their studies, though at St. Bartholomew's Hospital in 1834 "There was", he says, "very little, or no, personal guidance; the demonstrators had some private pupils, who they 'ground' for the college examinations . . .; the surgeons had apprentices, to whom they seldom taught more than to other students, for the most part the students guided themselves or one another to evil or to good, to various degrees of work or of idleness. No one was in any sense responsible for them".

One important change which took place mainly in this century was the increasing age at which medical education, and indeed university education of all kinds, was started. This change naturally affected both the customs of the students and the kind of discipline necessary to restrain and guide them. But in the United States an opposite movement took place at the end of this period, for Schussler (1928) tells us that at the very beginning of the twentieth century (and presumably at the end of the nineteenth) the medical students at the University of Minnesota were for the most part men who had already been pursuing other occupations for some years and many were fathers with families nearly or quite as old as the freshman of 1928. Many of these mature students still pursued their former occupations in a sporadic manner whilst studying medicine in order to pay their way, just as the American student of to-day often works his way through medical school.

As regards the 1830s, I shall make only passing reference to Dickens' Bob Sawyer and Ben Allen, not only because these famous characters are so well known, but also because their background and even their probable medical schools and haunts have been so vividly painted by my old friend Mr. T. B. Layton (1936). It will be obvious from my opening quotation that even by 1861 their kind had not greatly changed except in appearance. They were still very rough diamonds, living in rather sordid conditions, drinking far too much beer and brandy, fond of practical jokes and coarse humour, still subject to very little supervision or guidance—a mixed lot, as always, comprising all gradations from the waster to the man with a mission. Listen again for a moment to Albert Smith's description of the "grinder" or crammer struggling with his unruly class. " 'What would you do if you were sent for to a person poisoned by oxalic acid' asks the grinder. 'Give him some chalk' returns Mr. Rapp. 'But suppose you had not got any chalk in the house, what would you substitute?' 'Oh anything; soapsuds and pipeclay, old images or cheap confectionery.' 'Yes, that's all very right; but we will presume you could not get any soapsuds and pipeclay, old images or cheap confectionery; in fact, that there was nothing to be found about the

place. What would you do then?' Mr. Manhug cries out from the bottom of the table, 'Let him die and be d———!' 'Now, Mr. Manhug, I really must entreat of you to be more steady' interrupts the Professor. 'You would scrape the ceiling with the fire-shovel, would you not? Plaster contains lime, and lime is an antidote. Recollect that, if you please. They like you to say you would scrape the ceiling, at the Hall: they think it shows a ready invention in emergency. Mr. Newcome, you have heard the last question and answer?' 'Yes, sir' says the fresh arrival, as he finishes making a note of it. . . . 'Well; you are sent for to a man who has hung himself. What would be your first endeavour?' 'To scrape the ceiling with the fire-shovel' mildly observes Mr. Newcome"———and so on. I have no time to conduct you, with the help of the author, through all the metamorphosis of the London medical student, from the new man who "evinces an affection for cloth boots, or short Wellingtons with double soles, and toes shaped like a toad's mouth"; to the instructed student awaiting the awful ordeal of the examination at the Hall "His brain is as full of temporary information as a bad egg is of sulphuretted hydrogen, or a Putney omnibus of damp travellers on a wet day"; and finally to the man who has passed, consuming his "pot of Hospital Medoc" at the adjoining pub, till he and his companions in success finally "run about the streets, crowing like cocks, braying like donkeys, and indulging in the usual buoyant recreations that innocent and happy minds so situated delight to follow".

"Such were the youths who trod our path before,
A path most perilous in ancient times,
Struggling hard to learn Hygeia's lore
Through many ages and in different climes
Yet one with us, seeking a common goal.
What if their motives, to the critic's eyes,
Sometimes seem doubtful. Could we see the soul
Of every doctor then this dark surmise
Might well dissolve, and there beneath reveal
The light from Heaven, so oft unrecognised
From modesty or ignorance, yet real
And above all, by the wise doctor, prized.
For these young neophytes, though raw and wild
Yet had the stuff in them that brings
Peace to the mother of the wailing child
Courage to those afraid to spread their wings
Snatching the body from the brink of death
Changing the desperate gasp to quiet breath."

REFERENCES

ALLBUTT, T. C. (1921) Greek Medicine in Rome. London.
BOLINDER, G. (1954) Devil Man's Jungle (translated by M. A. Michael). London.
CABANÈS, A. (1913) Moeurs intimes du passé, 4me série. La vie d'étudiant. Paris.
CONTENAU, G. (1938) La Médecine en Assyrie et en Babylone. Paris.
DALRYMPLE-CHAMPNEYS, W. (1944) *Proc. R. Soc. Med.*, **37**, 89.
DIETZ, J. (1915) Meister Johann Dietz erzählt sein Leben. Ed. by Dr. Ernst Consentius. Ebenhausen bei München.
FAUVELLE, R. (1899) Les Etudiants en Médecine de Paris sous le Grand Roi. Paris.
FRIENDENWALD, H. (1944) The Jews and Medicine. Baltimore.
LAYTON, T. B. (1936) Dickens's Medical Students. A Pickwickian Essay by a Guy's Man. London.
LYON, D. M. (1941) *Edinb. med. J.*, **48**, 185.
MORGAN, E. (1922-23) The Three Crosses in the Purple Mists, *W. China Border Res. J.*
MYER, J. S. (1939) Life and Letters of Dr. William Beaumont. London.
NEUBURGER, M. (1910) History of Medicine (translated by Ernest Playfair). London.
OSLER, W. (1908) An Alabama Student and other Biographical Essays. London.
PAGET, J. (1901) Memoirs and Letters. London.
POUSSON (1931) L'enseignement, l'exercice de la médecine, et la vie universitaire à Bordeaux avant le Révolution, *J. Méd. Bordeaux*, **108**, 165.
PREUSS, J. (1923) Biblisch-talmudische Medizin. Berlin.
PUSCHMANN, T. (1891) A History of Medical Education from the Most Remote Period to the Most Recent Times. London.
RASHDALL, H. (1895) The Universities of Europe. Oxford.
RIESMAN, D. (1936) Life in a Mediæval University, *Ann. med. Hist.*, **8**, 395.
SCHUSSLER, O. F. (1928) *Minn. Med.*, **11**, 731.
SINCLAIR, H. M., and ROBB-SMITH, A. H. T. (1950) A Short History of Anatomical Teaching in Oxford. London.
SNOWMAN, J. (1935) A Short History of Talmudic Medicine. London.
VAULTIER, R. (1954) *Pr. méd.*, **62**, 431.
WITHINGTON, E. T. (1894) Medical History from the Earliest Times. London.
WONG, K. C., and WU, L. T. (1936) History of Chinese Medicine. 2nd ed. Shanghai.